# Critical Review:
# The effects of Montessori-Based Dementia Programming on engagement of persons with dementia within social contexts

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The purpose of this critical review is to examine the effects of Montessori-based Dementia Programming (MBDP) on engagement within social contexts. Using a computerized database search strategy of studies published from 2000 to present, four papers were selected to be included in this review. Study designs include: a mixed-design treatment study, a mixed-design treatment study and non-experimental case series (1), a within-subject treatment study (1), and a within-subject pilot study. Overall, results indicate that Montessori-based activities applied within social contexts increases positive and reduces negative engagement in persons with dementia as compared to standard unit activities with positive engagement being defined as motor or verbal behaviour and listening and/or looking in response to a target activity.

## *Introduction*

Dementia affects an individual's ability to communicate reducing their ability and opportunity to engage socially with their family and within their community (Bourgeois, Dujkstra, and Hickey, 2005). This poses many barriers to quality of life (O'Conner, Phinney, Smith, Small, Purves, Perry, Drance, Donnelly, Chaudhury, and Beattie, 2007). To further add to these barriers are those created by the social beliefs associated with dementia (Malone & Camp, 2007). Thus a shift towards personhood in dementia care is necessary (O'Conner et al., 2007; Davis, Byers, Nay, and Koch 2009). Changes are occurring in activity programming for people with dementia in long-term care homes and adult day care facilities. There is a growing trend towards activity programming that fosters active and social engagement (Orsulic-Jeras, Schneider, and Camp, 2000) as a way to address barriers to quality of life in dementia care. One such program is Montessori-Based Dementia Programming (MBDP).

MBDP is based on the Montessori system of education developed by Maria Montessori (Skrajner, Malon, Camp, McGowan and Gorzelle, 2007). The key components of the Montessori philosophy as described by Jarrott, Gozali, and Gigliotti (2008) are that (1) materials be taken from everyday environments to stimulate reminiscence, and procedural and emotional memory, (2) tasks be presented with progressive complexity (simple to complex; concrete to abstract) (Femia, 2006), (3) the focus be kept on the process of the activity, and (4) that activities control for error by increasing the probability of success (i.e. breaking an activity down, providing demonstration first, and continually adapting the environment according to individual need) (Orsulic-Jeras et al., 2000)

The Montessori method fosters independence, by focusing on and utilizing remaining strengths and abilities of individuals, in a way that is meaningful and interesting (Femia, 2006). According to Skrajner et al (2007), Montessori-based activities allow people with dementia to demonstrate their competence, fulfill meaningful social roles and contribute positively to their community.

Previous Montessori research with people with dementia has been to investigate its effect on engagement and affect in one-to-one individual contexts. This research has consistently revealed increases in positive engagement during Montessori-based activities as compared to standard unit programming (Camp, Judge, Bye, Fox, Bowden, Bell Valencic, & Mattern, 1997).

Given the impact of communication deficits in persons with dementia, there is a need to investigate the use of MBDP with in social contexts in order to address these communication needs. Furthermore, as noted by Jarrot et al. (2008), current care settings cannot support one-to-one programming and thus need to look for programming solutions that will promote personhood.

## *Objectives*

The impetus for this paper was an interest in personhood in dementia care and quality of life for individuals and families living with dementia. This led to a search for programs that focus on the social aspects of dementia care which included Montessori-based programming. The primary objective of this review is

to critically evaluate existing literature regarding the effects of Montessori-based programming on levels of engagement in individuals with dementia within a social context.

## *Methods*

Search Strategy

Computerized databases, including SCOPUS and PsycINFO, were searched using the following search strategy: (Montessori) AND (dementia) AND (engagement). The search was limited to articles written from 2000 to present as studies before this were largely done within an individual context.

Selection Criteria

Studies selected for inclusion in this critical review paper were required to investigate the effects of MBDP on engagement within a social context. Studies that looked at engagement during individual Montessori activities were excluded. No limits were set on the demographics of the research participants, outcome measures, or on location of program implementation.

Data Collection

The results of the literature yielded the following type of articles: mixed-design treatment study (2), within-subject treatment study (1), and within-subject pilot study (1).

## *Results*

*Statistical Analyses*

Paired sample t-tests were used in all studies to investigate interaction of engagement and treatment vs. control conditions. Schneider and Camp (2002), Lee et al., (2007), and Skrajner and Camp (2007) used analysis of variance (ANOVA) to investigate interaction of engagement with other factors when more than 2 variables were being manipulated.

*Measurement Tools*

Each of the four studies reviewed use similar observational measurement tools to measure level of engagement. Studies by Skrajner and Camp (2007), and Jarrot at al. (2008) use the Menorah Park Engagement Scale (MPES) (Judge, Camp, & Orsulic-Jeras, 2000) which is designed to measure the participants' amount and types of engagement during an activity. There are four distinct types of engagement:

- **Constructive engagement (CE):** Any motor or verbal behavior exhibited in response to the target activity
- **Passive engagement (PE):** Listening and/or looking in response to the target activity
- **Nonengagement (NE):** Staring off into space, keeping one's eyes closed, or sleeping during the activity.
- **Other engagement (SE):** Either self-engagement or engagement unrelated to the target activity.

Lee, Camp, and Malone (2007) used a similar scale called the Myers Research Institute Engagement Scale (MRI-ES) which included all the types of engagement from the MPES but distinguishes *other engagement* into two distinct categories:

- **Active engagement (AE):** Any motor or verbal behavior exhibited in response to the environment and not focused on the activity.
- **Self-engagement (SE)**

Schneider and Camp (2002) used an observational tool to measure engagement called the Resident Outcome Measure for Engagement. This included active engagement, passive engagement, non-engagement, and self-engagement. It excluded constructive engagement.

Only the MPES reports inter-rater reliability between scale developers. Studies using the MPES to measure engagement also reported inter-rater reliability among observers prior to the start of the study.

*Impact of MBDP on engagement*

*MBDP implemented in intergenerational programs*

Intergenerational programs (IGPs) in dementia care are planned activities that foster interaction between children and persons with dementia. These activities are mutually beneficial, and provide a structured environment that support social interaction and physical activity, and provide meaningful social roles and a change to display competence (Lee, Camp, and Malone 2007).

Lee et al., (2007) used a mixed design treatment study to evaluate the effect of Montessori-based activities used in intergenerational programs on engagement in residents with dementia. A total of 14 residents were matched with 15 children based on results from a qualitative measure called the Myers Menorah Park/Montessori Assessment System (MMP/MAS) that rates an activity appropriateness based on each individual participant (adult and child).

Adults were randomly assigned to one of two groups. Group #1 received 6 months of the control condition first (standard unit programming – individual, small and large group activities led by unit staff), followed by 6 months of the treatment condition (intergenerational program with Montessori based activities). Group #2 received 6 months of the treatment condition first followed by 6 months of the control condition. Chi square analyses showed no differences between groups.

Engagement was measured using the MRI-ES during 3 different times of the day: (1) before activities; (2) during activities; (3) after activities.

The data was analyzed using a 2x2x3 mixed model ANOVA design with a between-subject factor (to measure group effect), and 2 within-subject factors (programming type and time of observation). Post-hoc paired sample t-tests were used to compare engagement for both control and treatment conditions at each observation time.

Results of the data showed only one statistically significant effect between groups which was that group #1 showed less active engagement in the "after" time period than group #2. Significantly higher levels of constructive engagement (CE), and lower levels of passive (PE), self- (SE), and non- (NE) engagement were found "during" Montessori based intergenerational programs compared to "during" regular unit activities. No significant difference in engagement level was found in the "before" or "after" time periods for any of the engagement types with the exception of that already mentioned. Overall, higher positive and lower negative engagement was found during Montessori-based IGP as compared to control conditions.

The strengths of this study include a between group design component where treatment order was varied. This component was necessary to control for order effects. The randomization of group assignment increased the validity of this study. To further increase internal validity, researchers performed chi square analyses to see if differences existed between groups in gender, type of dementia, and education level. Once assigned to groups, participants were matched into adult-child dyads according to scores on the MMP/MAS. This ensured dyad suitability and that appropriate activities were assigned for each dyad. Furthermore, the duration of this study was not only reported (Lee et al., 2007, and Jarrot at al., 2008 specifically reported study length) but was conducted over a12 month duration. This allowed adequate time to capture treatment effects.

There are some limitations reported in this study. These included that of the work that needs to be completed ahead of time in order to thoughtfully prepare activities that match participants. This limitation could affect the applicability of Montessori-based IGPs within the community. Another area of limitation was the lack of data on the engagement of the child participants. Because IGP has mutual benefits, future research should include this component. Finally, the type of data collected did not assess interaction (number and type of verbalizations, demonstrations, feedback, and directions given) between adult and child per se.

Based on the study design, this study provides level 2c evidence. This is a well-designed study based on the type of design, duration, statistical analyses employed and overall conclusions. Given the limitations noted, the benefits to communication in dementia care remain incomplete. However, the suggestions for future research in the area of Montessori-based activities in intergenerational programming are compelling. Moreover, simplified training procedures for persons with dementia as well as more standardized methods of assessment would be needed to make this type of programming more clinically feasible.

*MBDP in Resident-Assisted-Montessori-Programming*

Resident-Assisted-Montessori-Programming (RAMP) is a program developed where persons with dementia are trained to lead small group activities for other residents with dementia. Typically, the leaders are in early to middle stages of dementia. Participants range from having early to advanced dementia. RAMP can be used with a variety of Montessori-based programs. In 2007, a mixed design treatment study done by Skrajner and Camp examined the effects of RAMP incorporated into a Montessori-based group reading activity called Question Asking Reading (QAR) on the engagement of participants.

QAR sessions consisted of a group reading exercise followed by group discussion. The stories are age-appropriate and related to common group interests. Participants may choose to take part in reading or may listen and follow along. The QAR procedure is the same each time with only the content of the story changing. This makes use of the procedural memory preserved in persons with dementia.

The study included two sites, a special care unit (SCU), and the other an adult day health center (ADHC). There were 3 residents selected from each site as activity leaders (total of 6 leaders). A total of 22 residents participated (6 at ARDC, and 16 at SCU).

At each site, participants were observed during regular unit programming (baseline 1) as well as during RAMP thus each participant acted as their own control. A Baseline 2 measure was also taken where the participants were observed during regular unit programming after the start of RAMP in order to capture any generalization of effects. Engagement was measured using the MPES.

The data was analyzed using repeated measures analyses of Variance (ANOVA), using a priori simple contrasts (B1x treatment; B2 x treatment). A between-subject factor was also included to detect differences between groups and type of session.

No differences between sites were revealed with the exception of a significant contrast for PE during B2 where ADHC showed more PE during standard activities than during RAMP at B2. SCU showed more PE during RAMP than during standard activities at B2. Overall, results suggest that RAMP may increase positive engagement during RAMP compared with standard activities programming.

Based on the research design, this study provides level 2c evidence. The strengths of this study included clear criterion for leader qualification. In terms of participants, there was a broad range of variability in stage of dementia of those who participate. This increases the generalizability of research findings. Statistical manipulations appear to be appropriate and thorough.

The limitations reported included small sample size for both leaders and participants. Also, training was provided by the researchers. Authors indicate this to be a limitation because in order for RAMP to be a viable form of meaningful intervention for persons with dementia, training must be provided by staff of long-term care and adult day care facilities. This means that training procedures must be simplified and more standardized.

This study showed a moderate level of internal validity due to its clear eligibility criteria, research design, valid and reliable measurement tools used, and use of appropriate statistical measures. However, some caution is warranted when interpreting the results of this study as groups were not measured for individual differences prior to the onset of the study which could threaten internal validity. Also, the leaders, as well as the participants were almost entirely female (with the exception of one male leader, and 1 male participant). This distribution may limit the generalizability of the findings.

*MBDP implemented in small groups*

In 2008, a study by Jarrot at al. conducted a 10 week within-subject treatment study to investigate the effects of Montessori-based activities on engagement with persons with dementia utilizing small parallel groups and incorporating contextual scripts. Jarrot et al. postulated that such group conditions would support reminiscence and social interaction evidenced by increased positive engagement as compared to traditional activities (i.e. crafts). Engagement was measured using the MPES

Ten participants were divided into 3 groups. Control for individual variances across group demographics was not reported. Researchers did report control for time of day effects whereby all activities (both regular and Montessori-based activities) were conducted in the morning for 20-30 minutes.

'Parallel' activities (each individual receives an individual set of activity materials for the same activity to complete side-by-side) opposed to 'task group' (activity completion depends on each person's contribution) activities were used during the small group Montessori sessions.

The data was analyzed using paired sample t-tests to compare each engagement during Montessori activities as well as during traditional programming. Because there is only two variables being compared, paired sample t-tests were appropriate statistical tests to analyze the data.

The results of the data revealed that the average time spent constructively engaged was significantly higher during Montessori-based group activities as compared to traditional programming. Also, participants exhibited significantly lower levels of self- and non-engagement during Montessori-based group activities as compared to traditional programming. Passive engagement did not differ significantly during Montessori-based group activities as compared to traditional programming and results yielded a small effect size – findings that are not consistent with past Montessori research. Authors suggest that this could be a result of reduced one-to-one interaction (an inherent quality of group activities) as compared to individual based activities found in past Montessori research.

This study showed good internal validity in that it was clear on measurement procedures, measures were valid and reliable, demographics of participants were heterogeneous, and study procedures were well laid out. Separate researchers were used for measuring engagement and affect so to ensure adequate representation of these variables in the data.

Based on the research design, this study provides level 2c evidence. Overall, the clinical importance is compelling.

*MBDP implemented by family members*

Schneider and Camp (2002) used a within-subject pilot study to evaluate the impact of MBDP on engagement when implemented by family members visiting nursing

home residents with dementia. A total of 8 residents-family dyads took part in the study. Engagement and affect were observed at baseline and then again during the test-period where family members used MPDP with the residents. Additionally, researchers' wanted to evaluate how duration of activity effected engagement (early versus late part of the visit).

Appropriate statistical analyses were conducted using paired sample t-tests and 2X2 Repeated Measures Analysis of Variance (ANOVA). An opinion survey was also used at the conclusion of the study.

Results of the study showed increased active engagement and decreased passive engagement during MBDP with family members as compared to regular activity programming. However, although there was an overall increase in active engagement during MBDP, active engagement decreased with duration of all activities. Authors noted that fatigue may be a factor influencing levels of active engagement throughout activities. Results from the visitor outcome measures showed significant decreases in self-reported burden. The opinion survey revealed that visitors wished to continue using Montessori based activities, and that they would recommend MBDP to other visitors. The survey also showed that visitors saw positive changes in their loved ones during MBDP. Overall, results indicated that visitors can use Montessori-based activities successfully. Further research is suggested to look at how training family members can be most efficient and effective.

This was a well-designed pilot study. Based on the research design, this study provides level 2c evidence. The statistical analyses were appropriate and the outcome measures were valid. Although the Visitor Outcome Measure was clearly explained, the Resident Outcome Measure for engagement was not with the exception of engagement types. Furthermore, this is the only study that focused on active engagement (AE) opposed to constructive engagement (CE). Because AE is defined as any engagement towards the environment (not specific to the activity) and CE was not analyzed, it is unclear as to whether the positive changes in engagement found during visits where family members used Montessori-based activities were due to the Montessori-based activities or due to another confounding variable (i.e. positive family interaction in general).

Limitations reported by the authors besides the small sample size, included a possible confounding variable of pre-established positive resident-family relations suggesting that the results may not generalize to strained familial relationships. Also, the demographics of the participants were relatively homogenous (white Jewish people). Thus more heterogeneous samples would be preferred in order to increase internal validity.

### *Discussion*

This paper critically reviewed the outcomes of MBDP on engagement within social contexts. Based on the reviewed articles, there appears to be suggestive evidence that positive engagement is increased and negative engagement is reduced with the implementation of MBDP in individuals with dementia.

The studies included in this review were designed with level 2c evidence with a within-subject component to the research design. With this design strategy, each participant receives both the control and treatment conditions thus acting as their own control. In doing so, subject-to-subject variation is removed and internal validity is increased. Overall, the results suggest that the findings provide a compelling level of evidence. However, the small sample sizes (ranging from 8-22) of these studies limits the generalizability of results to the population of adults with dementia. Only one study calculated effect size to address this limitation in order to indicate clinical significance.

Out of the two studies (Lee et al., 2007; Schneider and Camp, 2002) that used outside participants to engage with the residents, only Schneider and Camp (2002) looked at outcomes for both residents as well as family members which is important clinically as communication is an interactive phenomenon.

The study by Jarrot et al. (2008) was the only study where Montessori-based activities were implemented by staff members – a design component that deviates from other Montessori-based research, where the sessions are implemented or facilitated by researchers. This increases the external validity of research findings. Although the results found by Jarrot et al. suggested that Montessori-based group activities increased positive engagement in individuals with dementia, the authors go on to suggest that these results correspond to increases in reminiscence and social interaction. However, no measurements as to reminiscence and social interaction were reported. Thus, the methodology may lack face validity.

### *Recommendations*

*Future research should focus on:*

- In order to better understand how MBDP influences social interaction assessment of the types of interaction (i.e. number and type of verbalizations) that comprise the positive engagement of individuals with dementia may be warranted.

- It would be valuable to assess the interaction types of those who interact with these individuals.
- A simplification of training procedures for persons with dementia as well as for staff and family members would be needed in order for MBDP to be feasible in long term care homes, adult day cares, and within community settings.
- Continuing to integrate MBDP into a variety of social activities and contexts.

*Clinical Implications*

- MBDP provides a possible solution to the need for innovative and sustainable programs in dementia care.
- MBDP implemented within social contexts may improve how an individual with dementia can communicate and participate meaningfully within their community as it focuses on individual needs, strengths, and interests.
- Evidence suggests that MBDP has the potential to help these individuals maintain relationships and foster new ones, regardless of the stage of dementia they may be in.

## *Conclusion*

There is growing evidence that MBDP can be implemented within social contexts in order to foster active and social engagement in individuals with dementia. This is a positive step towards improving dementia care and improving the quality of life for people living with dementia and their families.

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